

Case 2840***Coelurus bauri* Cope, 1887 (currently *Coelophysis bauri*; Reptilia, Saurischia): proposed replacement of the lectotype by a neotype**

Edwin H. Colbert

Museum of Northern Arizona, Route 4, Box 720, Flagstaff, Arizona 86001, U.S.A.

Alan J. Charig

Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

Peter Dodson

School of Veterinary Medicine, University of Pennsylvania, 3800 Spruce Street, Philadelphia, Pennsylvania 19104, U.S.A.

David D. Gillette

Division of State History — Antiquities, 300 Rio Grande, Salt Lake City, Utah 84101-1182, U.S.A.

John H. Ostrom

Peabody Museum, Yale University, New Haven, Connecticut 06520, U.S.A.

David Weishampel

School of Medicine, Johns Hopkins University, Baltimore, Maryland 21205, U.S.A.

Abstract. The purpose of this application is to propose a neotype for the well-known Triassic dinosaur *Coelurus bauri* Cope, 1887, the type species of *Coelophysis* Cope, 1889. Hunt & Lucas (1991) have suggested that Cope's name is a nomen dubium because of the fragmentary nature of the original type material; they erected a new nominal taxon *Rioarribasaurus colberti* Hunt & Lucas, 1991. This action is unnecessary and confusing. Extraordinarily abundant remains of this dinosaur are known from the general locality and the horizon where Cope's specimens were found. It is proposed that a complete skeleton, the holotype of *R. colberti*, be designated as the neotype of *Coelurus bauri* Cope, 1887 thereby rendering *C. bauri* a senior objective synonym of *R. colberti* and providing a much more informative type specimen.

1. Cope (1887a, p. 368) named two dinosaur species, *Coelurus bauri* and *C. longicollis*, based upon fragmentary fossils collected by David Baldwin in 1881 from Upper Triassic sediments at two localities in northern New Mexico (Rio Arriba County),

namely Arroyo Seco near its confluence with the Chama River and near Cerro Blanco. No holotypes were designated and there were no illustrations. Cope subsequently (1887b, pp. 221–227) transferred the two nominal species to the genus *Tanystropheus* and added a new species, *T. willistoni*.

2. In 1889 Cope (p. 626) established the new genus *Coelophysis* for the three species he had described, but none was designated as the type species. Cope's specimens (isolated fragmentary skeletal elements with no skull bones or teeth) and species were redescribed by von Huene (1915, pp. 500–507), who provided the first illustrations. American Museum of Natural History numbers were given to 38 specimens by von Huene; several were listed as 'types' of each of the three species but this action has no validity under the Code.

3. Hay (1930, p. 186) designated *Coelophysis bauri* as the type species of the genus. Welles (1984, pp. 159–160) selected as 'lectotype' for *C. bauri* a fragmentary ilium (specimen AMNH 2708) from among the Cope fossils. This designation is however invalid: the specimen had been placed by Cope (1887b) in *Coelurus longicollis* and was assigned to *C. bauri* only by von Huene (1915).

4. In 1947 a prolific deposit of Triassic dinosaur skeletons was discovered at Ghost Ranch, New Mexico, by a party from the American Museum of Natural History (Colbert, 1947, pp. 392–399). Blocks of fossil bones were obtained composed almost entirely of dinosaur skeletons, identified by Colbert (1947) as *C. bauri*. The quarry from which they were recovered is probably within 2 km of the Arroyo Seco locality from which Baldwin had collected many of the fossils described by Cope (see para. 1) and is approximately at the same stratigraphic level (in Baldwin's words 'four hundred feet below gypsum stratum'; see also Schwartz & Gillette, in press). Additional collections from this quarry were made by several museums in 1948, 1981, 1982 and 1985, and particularly important cooperative excavations were made in 1981 and 1982 by the Carnegie Museum, the New Mexico Natural History Museum, the Museum of Northern Arizona, and the Peabody Museum of Yale University.

5. For the better part of a century the generic name *Coelophysis* has been widely used as representing an ancestral theropod dinosaur. Since 1948 this usage has been based on full knowledge of the skeleton as exemplified by the numerous complete specimens from the Ghost Ranch quarry.

6. Padian (1986, pp. 45–60) reviewed Cope's material, listing the 38 specimens figured by von Huene (see para. 2) and seven further original specimens. In an extensive review Colbert (1989) included these and about 100 subsequently excavated specimens (which represent only a fraction of those now prepared or being prepared) from six major North American museums and concluded that all the *Coelophysis* specimens are properly included in the single species *C. bauri*, of which they represent various ontogenetic stages. Colbert (p. 33), at that time unaware of the invalid selection by Welles mentioned in para. 3, designated specimen AMNH 2722, a series of four sacral vertebrae, as the lectotype of *Coelurus bauri* Cope, 1887.

7. Rowe & Gauthier (1990, pp. 152–153, 165–168) presented a study of theropods that identifies an early radiation of forms that these authors termed Ceratosauria. They explicitly, and independently of Colbert (1989), accepted *Coelophysis bauri* as the proper name for the Ghost Ranch material and used the characters in this material for their analyses. This is consistent with the historical usage of the name and illustrates the importance of this taxon to the understanding of the evolution of Theropoda.

8. Hunt & Lucas (1991, p. 191) erected a new nominal taxon, *Rioarribasaurus colberti*, for the fossils from the Ghost Ranch Quarry, claiming that *Coelophysis bauri* (Cope, 1887) is a nomen dubium. This action was based on their contention that the lectotype designated by Colbert (see para. 6) is not diagnostic; they correctly pointed out that the earlier selection by Welles was invalid. Hunt & Lucas maintained that the Ghost Ranch quarry is at a different horizon from that of the sediments from which Baldwin had collected the fossils for Cope, an argument strongly disputed by Schwartz & Gillette (in press; see also para. 4 above). The establishment of new generic and specific names is unnecessary because individual bones from Ghost Ranch are obviously identical to corresponding elements in the Cope fossils. Hunt & Lucas did not dispute the synonymy of *C. bauri* (as always understood) and *R. colberti* so their name should not be used as valid.

9. The name *Coelophysis bauri* is more than 100 years old and is solidly entrenched in the literature, both technical and popular. *C. bauri* is now known from many hundred specimens of which a large proportion consists of articulated skeletons. It has been designated as the official State Fossil of New Mexico and it is the logo of the New Mexico Museum of Natural History.

10. Although the specimen designated by Colbert (1989; see para. 6) as the lectotype of *C. bauri* is in our opinion undoubtedly conspecific with the complete articulated skeleton (AMNH 7224 in the American Museum of Natural History) which is the holotype of *Rioarribasaurus colberti*, it is desirable to make the synonymy of the two nominal species objective and to have a much more informative type specimen of *C. bauri*. None of Cope's original material is suitable for the latter purpose. We therefore propose that specimen AMNH 7224 be designated the neotype of *C. bauri*, thereby rendering *bauri* a senior objective synonym of *R. colberti*. The generic names *Coelurus* and *Rioarribasaurus* also become objective synonyms.

11. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to set aside all previous fixations of type specimens for the nominal species *Coelurus bauri* Cope, 1887;
- (2) to designate the articulated skeleton AMNH 7224 in the American Museum of Natural History as the neotype of the nominal species *Coelurus bauri* Cope, 1887;
- (3) to place on the Official List of Generic Names in Zoology the name *Coelophysis* Cope, 1889 (gender: feminine), type species by subsequent designation by Hay (1930) *Coelurus bauri* Cope, 1887;
- (4) to place on the Official List of Specific Names in Zoology the name *bauri* Cope, 1887, as published in the binomen *Coelurus bauri* and as defined by the neotype designated in (2) above (specific name of the type species of *Coelophysis* Cope, 1889);
- (5) to place on the Official Index of Rejected and Invalid Generic Names in Zoology the name *Rioarribasaurus* Hunt & Lucas, 1991 (a junior objective synonym of *Coelophysis* Cope, 1889);
- (6) to place on the Official Index of Rejected and Invalid Specific Names in Zoology the name *colberti* Hunt & Lucas, 1991, as published in the binomen *Rioarribasaurus colberti* (a junior objective synonym of *Coelurus bauri* Cope, 1887).

References

- Colbert, E.H. 1947. The little dinosaurs of Ghost Ranch. *Natural History*, **56**: 392–399, 427–428.
- Colbert, E.H. 1989. The Triassic dinosaur *Coelophysis*. *Museum of Northern Arizona Bulletin*, **57**: 1–160.
- Cope, E.D. 1887a. The dinosaurian genus *Coelurus*. *American Naturalist*, **21**: 367–369.
- Cope, E.D. 1887b. A contribution to the history of the Vertebrata of the Trias of North America. *Proceedings of the American Philosophical Society*, **24**: 221–227.
- Cope, E.D. 1889. On a new genus of Triassic Dinosauria. *American Naturalist*, **23**: 626.
- Hay, O.P. 1930. *Second bibliography and catalogue of the fossil Vertebrata of North America*. Publication No. 390, vol. 2. Carnegie Institution of Washington.
- Huene, F. von. 1915. On reptiles of the New Mexican Trias in the Cope Collection. *Bulletin of the American Museum of Natural History*, **34**: 485–507.
- Hunt, A. & Lucas, S. 1991. *Rioarribasaurus*, a new name for a late Triassic dinosaur from New Mexico (USA). *Palaeontologische Zeitschrift*, **65**: 191–198.
- Padian, K. 1986. On the type material of *Coelophysis* Cope (Saurischia; Theropoda) and a new specimen from the Petrified Forest of Arizona (Late Triassic: Chinle Formation). Pp. 45–60 in Padian, K. (Ed.), *The beginning of the age of dinosaurs. Faunal change across the Triassic-Jurassic boundary*. Cambridge University Press, Cambridge.
- Rowe, T. & Gauthier, J.A. 1990. Ceratosauria. Pp. 151–168 in Weishampel, D.B., Dodson, P. & Osmolska, H. (Eds.), *The Dinosauria*. University of California Press, Berkeley.
- Schwartz, H.L. & Gillette, D.D. 1992. Geology and taphonomy of the *Coelophysis* quarry, Upper Triassic Chinle Formation, Ghost Ranch, New Mexico. *Journal of Paleontology* (in press).
- Welles, S.P. 1984. *Dilophosaurus wetherilli* (Dinosauria, Theropoda) osteology and comparisons. *Palaeontographica*, (A) **185**: 85–180.